

CLAIMS

- 1 1. A stator coil group for an electromotive machine comprising:
 - 2 a first coil having longitudinal sections, circumferential sections and a thickness, each of
 - 3 the longitudinal sections of the first coil having a width forming a first curve, the longitudinal
 - 4 sections and circumferential sections of the first coil defining a substantially rectangular opening;
 - 5 and
 - 6 a second coil having longitudinal sections, circumferential sections and a thickness, each
 - 7 of the longitudinal sections of the second coil having a width forming the first curve, the
 - 8 longitudinal sections and circumferential sections of the second coil defining a substantially
 - 9 rectangular opening, the widths of the longitudinal sections of the first and second coils being
 - 10 greater than the respective thicknesses of the first and second coils, one of the longitudinal
 - 11 sections of the first coil being at least partially disposed in the rectangular opening of the second
 - 12 coil and one of the longitudinal sections of the second coil being at least partially disposed in the
 - 13 rectangular opening of the first coil.
- 1 2. The stator coil group of claim 1 wherein the longitudinal sections of the first coil and the
- 2 longitudinal sections of the second coil have ends, at least one of the first coil and the second coil
- 3 having step bends at each end of the respective longitudinal sections.
- 1 3. The stator coil group of claim 1 further comprising:
 - 2 a first outer coil having longitudinal sections, circumferential sections and a thickness,
 - 3 each of the longitudinal sections of the first outer coil having a width forming a second curve, the
 - 4 longitudinal sections and circumferential sections of the first outer coil defining a substantially
 - 5 rectangular opening; and
 - 6 a second outer coil having longitudinal sections, circumferential sections and a thickness,
 - 7 each of the longitudinal sections of the second outer coil having a width forming the second
 - 8 curve, the longitudinal sections and circumferential sections of the second outer coil defining a
 - 9 substantially rectangular opening, the widths of the longitudinal sections of the first and second
 - 10 outer coils being greater than the respective thicknesses of the first and second outer coils, one of

11 the longitudinal sections of the first outer coil being at least partially disposed in the rectangular
12 opening of the second outer coil and one of the longitudinal sections of the second outer coil
13 being at least partially disposed in the rectangular opening of the first outer coil.

1 4. The stator coil group of claim 3 wherein the longitudinal sections of the first outer coil
2 and the longitudinal sections of the second outer coil have ends, at least one of the first outer coil
3 and the second outer coil having step bends at each end of the respective longitudinal sections.

1 5. A stator coil group for an electromotive machine comprising:

2 a plurality of first coils, each first coil having a pair of longitudinal sections, a pair of
3 circumferential sections and a thickness, each of the longitudinal sections of the first coils having
4 a width forming a first curve, the longitudinal sections and circumferential sections of each first
5 coil defining a substantially rectangular opening therein; and

6 a plurality of second coils, each second coil having a pair of longitudinal sections, a pair
7 of circumferential sections and a thickness, each of the longitudinal sections of the second coils
8 having a width forming the first curve, the longitudinal sections and circumferential sections of
9 each second coil defining a substantially rectangular opening therein, the widths of the
10 longitudinal sections of the first and second coils being greater than the respective thicknesses of
11 the first and second coils, one of the longitudinal sections of each first coil being at least partially
12 disposed in the rectangular opening of an adjacent one of the second coils and one of the
13 longitudinal sections of each second coil being at least partially disposed in the rectangular
14 opening of an adjacent one of the first coils, each of the first coils being in serial electrical
15 communication with a respective one of the second coils to form a coil pair.

1 6. The stator coil group of claim 5 wherein one of the coil pairs is in parallel electrical
2 communication with one of the other coil pairs.

1 7. The stator coil group of claim 5 wherein the longitudinal sections of the first and second
2 coils have ends, at least one of the first plurality of coils and the second plurality of coils having
3 step bends at each end of the respective longitudinal sections.

1 8. The stator coil group of claim 5 further comprising:

2 a plurality of first outer coils, each first outer coil having a pair of longitudinal sections, a
3 pair of circumferential sections and a thickness, each of the longitudinal sections of the first outer
4 coils having a width forming a second curve, the longitudinal sections and circumferential
5 sections of each first outer coil defining a substantially rectangular opening therein; and

6 a plurality of second outer coils, each second outer coil having a pair of longitudinal
7 sections, a pair of circumferential sections and a thickness, each of the longitudinal sections of
8 the second outer coils having a width forming the second curve, the longitudinal sections and
9 circumferential sections of each second outer coil defining a substantially rectangular opening
10 therein, the widths of the longitudinal sections of the first and second outer coils being greater
11 than the respective thicknesses of the first and second outer coils, one of the longitudinal sections
12 of each first outer coil being at least partially disposed in the rectangular opening of an adjacent
13 one of the second outer coils and one of the longitudinal sections of each second outer coil being
14 at least partially disposed in the rectangular opening of an adjacent one of the first outer coils,
15 each of the second outer coils being in serial electrical communication with one of the first coils,
16 one of the second coils and one of the first outer coils to form a coil set.

1 9. The stator coil group of claim 8 wherein one of the coil sets is in parallel electrical
2 communication with one of the other coil sets.

1 10. The stator coil group of claim 8 wherein the longitudinal sections of the first and second
2 coils have ends, at least one of the first plurality of outer coils and the second plurality of outer
3 coils having step bends at each end of the respective longitudinal sections.

1 11. An electromotive machine comprising:

2 a permanent magnet rotor having a rotor axis;

3 a plurality of first coils, each first coil having a pair of longitudinal sections, a pair of
4 circumferential sections and a thickness, each of the longitudinal sections of the first coils having

5 a width forming a first curve, the longitudinal sections and circumferential sections of each first
6 coil defining a substantially rectangular opening therein; and

7 a plurality of second coils, each second coil having a pair of longitudinal sections, a pair
8 of circumferential sections and a thickness, each of the longitudinal sections of the second coils
9 having a width forming the first curve, the longitudinal sections and circumferential sections of
10 each second coil defining a substantially rectangular opening therein, the widths of the
11 longitudinal sections of the first and second coils being greater than the respective thicknesses of
12 the first and second coils, the longitudinal sections of the first and second coils being disposed at
13 a fixed radial distance from the rotor axis, one of the longitudinal sections of each first coil being
14 at least partially disposed in the rectangular opening of an adjacent one of the second coils and
15 one of the longitudinal sections of each second coil being at least partially disposed in the
16 rectangular opening of an adjacent one of the first coils.